Creative technological trajectories and long networks

Capecchi, Vittorio; Gallina, Andrea

Publication date:
2006

Document Version
Publisher's PDF, also known as Version of record

Citation for published version (APA):
Capecchi, V., & Gallina, A. (2006). *Creative technological trajectories and long networks*. Roskilde Universitet. Research report / Federico Caffe Centre No. 3

ISSN 1396-5085

Federico Caffè Centre Research Reports Nr.3/2006

Creative Technological Trajectories and Long Networks

By

Vittorio Capecchi & Andrea Gallina

Federico Caffè Centre – Department of Social Sciences Roskilde University -
Universitetsvej, 1 DK-4000 Roskilde Denmark Tel: +45 4674 2162 / Fax: +45 4674 3083
EMAIL: cses@ruc.dk Home page: www.ruc.dk/federico

Federico Caffè Centre Research Reports
N. 3/2006

Creative Technological Trajectories and Long Networks

By
Vittorio Capecchi & Andrea Gallina

For any correspondence with the authors please contact:
Associate Prof. Andrea Gallina
Department of Social Sciences – Roskilde University
Universitesvej, 1 DK-4000 Roskilde
Tel: +45 4674 2536 / +45 2041 5675
Email: agallina@ruc.dk

Creative Technological Trajectories and Long Networks

Vittorio Capecchi[1] & Andrea Gallina[2]

1. Introduction

Neoliberalist thinking with its strategies of globalisation[3] has managed to impose norms and standards that have reinforced the functioning of global enterprise and the hegemonic structure of international relationships dominated by the United States through the control of the trident WTO, World Bank and the International Monetary Fund and a military apparatus without rivals. The basic points of neoliberalist thinking, both in Milton Friedman's (1962) classic version as well as in more recent ones by Peter Schwartz and Peter Leiden (1997, 1998), not only reiterate that the sole social responsibility of enterprise is profit in favour of shareholders, but seek to impose the recipe of neoliberalism, namely that of "destroying unions, privatising all public industries and dismantling the welfare state" [4]. Indeed, neoliberalist thought considers enterprise as the sole player (and in particular large multinational and transnational companies) believing, with an acritical optimism that is always denied by the facts, that an increase in profits have a spin-off effect (the so-called *trickle down effect*) that sooner or later should benefit all people of all the different nations. Within neoliberalist thought, scientific and technological researches, as well as the organisation of the educational system, are therefore entirely viewed as a function of enterprise and realisation of these profits, with technological innovation projects promising the highest profits in the short term clearly being privileged.

The result of the spread of neoliberalist thought from the United States to Europe and to all the other parts of the world is apparent by considering two different points of view: that of "human rights" and that of the direction of markets and technological innovation.

The viewpoint of "human rights" has emerged, with all its consequences, following the scandals involving among the most important multinational and transnational companies. As the jurist Joel Bakan writes (2004, p. 74) "From the Enron case it is necessary to draw a more profound lesson (...). Although the company is known for the arrogance and arguable ethics of its directors, the underlying reasons for its collapse can be traced to characteristics common to all corporations: obsession with profits and share prices, greed, lack of concern for others, and a penchant for breaking legal rules. These traits are, in turn, rooted in an institutional culture, the corporation's, that valorises self-interest and invalidates moral concern".

---

[1] University of Bologna, Director of Master in *Technologies for the quality of life* and Visiting Professor University of Roskilde.

[2] Centro Federico Caffè, Department of Social Sciences, University of Roskilde.

[3] The term "globalization" is used in this paper to define the most recent phase of the process of transnational capitalist accumulation (Bruno Amoroso, 1998; Samir Amin, 2000; Leslie Sklair, 2002; Andrea Gallina, 2004).

[4] The citation is in the essay by P. Schwartz and P. Leiden (1997, p. 128). The same evaluations are repeated in the book by P. Schwartz, P. Leiden, J. P. Hyatt (1998)

As was reconstructed by Capecchi (2005), it was following these scandals and the first attempts to prosecute a number of the more well known multinationals for violation of human and environmental rights (Shell in Nigeria, Coca Cola in Colombia, Unical in Burma, Pentland in Pakistan, Nike in Indonesia, Del Monte in Kenya etc..) that the UN Commission for human rights decided in 2004 to draft the *United Nations Norms on the Responsibilities of Transnational Corporations and Other Business Enterprises with Regard to Human Rights*[5] in order to propose to the ensemble of the world's nations a common set of regulations able to control and prosecute in case of violations multinationals that do not take account of human rights.

This proposal was presented to various governments of the world and to a number of international bodies (from those grouping together multinationals to those that representing unions or non-governmental organisations). The response to this UN Commission for human rights proposal shows the force of neoliberalist thought. In fact, in the www.business-humanrights.org website, it is possible to read all those comments that reveal an initial major division. All the neoliberalist governments (from the United States under Bush to that of the Italian government under Berlusconi) and the principal multinational organisations (the International Chamber of Commerce) are lined up in favour of the autonomy of multinationals and their power to violate human rights with as much impunity as possible. Instead, governments that are more sensitive to these themes (such as the Scandinavian ones), associations of international unions, organisations such as Amnesty International and Greenpeace are in favour of the proposal. There is also, and this is surely one of the few positive reports, a small group of multinationals, almost entirely from Scandinavian countries, that have decided to gather together in an association, namely the *Business Leaders Initiative on Human Rights* (BLIHR), declaring to accept the proposal of the UN Commission and operate in the different countries in which their products are made or sold, without fearing the costs that may be entailed in order to respect human and environmental rights.[6]

Excepting these limited cases, the syntony between neoliberalist governments and multinationals is total when this regards eliminating every control and ensuring the greatest impunity possible for multinationals with respect to violating human and environmental rights.

The scenario emerging on considering the trends of market flows and technological innovation is equally negative. What has happened in an accelerated fashion, beginning from the 1970s, has been the concentration of the production of goods and services and of consumption inside the so-called Triad (United States, Europe and Japan). As is highlighted on the cover of the of the UNDP (*United Nations Development Programme*) report of 1993, the fifth richest of the world's population (the 20% living in the nations of the triad and immediate neighbouring countries) possess 82.7% of the wealth produced (Gross National Product), 81.2% of global trade, 94.6% of bank loans and 80.6% of all investments and savings, while 80% of the world's population possess only 17.3% of global wealth, 5.4% of bank loans and 19.4% of all investments and savings. International capitalism has therefore no longer sought out new markets and the increase of people who could become "new consumers" in the world. If China and India are excluded, the world's poorest nations have become increasingly poor and the gap between nations has grown. As the UNDP (2000) report demonstrates considering three years (1975, 1990 and 2000), if the annual earnings per capita is taken as an indicator (the data can be compared in so far as they are all expressed on the basis of the purchasing power of the dollar in 2000), it appears that the gap between the wealthiest nations of the OECD (23 nations that include Europe, United States, Japan, Canada, Australia and New Zealand where 14.5% of the global population live) and the other nations of the world has *increased*. Indeed, in the richest nations of the OECD the average per capita income has more than doubled in absolute value from 1975 to 2000, passing from 16.048 dollars to 27.843 dollars and these values are *increasingly more distant* from the average values of all the world's nations. In 1975, the gap between the two average earnings per capita was roughly 11.000 dollars; in 2000 it was almost 20.000 dollars. Furthermore, internal inequalities within nations, also in the wealthiest like the United States, have increased.

In addition to this trend toward concentrating the flows of wealth and trade, there is the tendency toward concentrating scientific and technological research (with related production of

---

[5] The text is available in English in the site: www.business-humanrights.org and has been printed in Italian thanks to Amnesty International in 2004.

[6] The first reports of this association of counter-current firms can be read at www.blihr.org

technologically advanced goods and services) in weapons and superfluous goods (the domain of so-called "free time") with a parallel reduction (and distortion) in the planning and production of goods and services for the quality of life of people and the environment.

The increased investment in research and production of arms is ever more apparent. As described by the physicist Angelo Baracca (2005), the investments by the United States, Israel, Great Britain etc. in nuclear weapons are increasingly greater. After the Non-proliferation of nuclear weapons treaty in 1970 and the Start 1 and Start 2 treaties of the 1990s, likewise in the direction of non-proliferation, there was a reversal of the trend. The United States, Israel and other nuclear states decided to commit themselves to the maintenance and upgrading of nuclear weapons and fourth generation nuclear arms like the pure fission micro nuclear bomb, but bearing in mind that the "military presence is a social tumour that generates real tumours"[7]. Equally striking is the increase of investments in the "free time" industry. In the triad the innovation of communication and information technologies has led the earnings of the film and television industries to be ever higher than earnings of traditional industrial sectors and the products of these investments are consumed all over the world. Instead, the area of scientific and technological innovation for the realisation of goods and services for the quality of life and the environment has on the whole diminished (with respect to weapons and free time products) and is characterised by elements of profound distortion owing to the consequences of concentrating technological investments (also of this area) in the triad. In fact, this concentration has led to an increase in investments for the wealthiest part of the population (investments in cosmetics, diet, plastic surgery etc…) neglecting research to combat diseases present in the less industrialised parts of the world (where the problem is access to drinking water and how not to die of hunger and not a problem of diet or plastic surgery) and destructive technological strategies have been experimented such as: (a) those by the pharmaceutical multinationals which "in order to resolve world famine" impose, through pressure by international economic bodies the sowing of GMO that serve only to increase their profits and cause damage in the middle term in the areas in which these seeds are used; (b) that of the pharmaceutical multinationals that are not concerned with broadening their consumption in the poorer parts of the world which demand retroviral drugs for AIDS and many other drugs, preferring to impose costs of the medicines that cannot be met by these populations but can be paid by the richest part of the triad.

Given these tendencies, one may ask if it were not too abstract and fanciful to seek alternative technological/enterprise paths to the neoliberalist thinking which break the logic within triadic capitalism such as trade flows, scientific/technological innovation and the defence of human rights. As Serge Latouche writes, one may ask if a path heading towards a society "that leads the economic and the technical into the social, that embodies Prometheus, that leads the economic and the technical back into the subordinate role which competes rather than entrust all human problems to the boundless dominion of nature and a blind and generalised solution"[8] is realistic

Two answers may be proposed to the question. The first answer can be found in books such as those by Castoriadis (1996), Latouche (2003 a,b) and Petrella (2004). What is needed, as Castoriadis and Latouche write, is to have the courage in the nations where 20% of the population live to "decolonise the imaginary" and interrupt the mad race towards the constant increase in making destructive or superfluous products, imagining a society in which profit ceases to be the central value and setting new key words like "growing down", namely creative thinking against the economy of the absurd. It is necessary, as Petrella writes, to take up once again the right to dream because "dreaming is not fleeing from reality, it is breaking away from the evidence, deliberately leaving the paths of obedience, projecting oneself into a reality that one dares to think of as different".

The second answer is, notwithstanding the recurrent celebrations of triumph by the upholders of globalisation or the desperation and a sense of defeat by pessimists, that the "social ties"[9] between people and their communities have allowed surviving economic marginalisation, political

---

[7] We refer to the subtitle of the book edited by the movement "scientists against war" (2005) that analyses the devastating consequences of war and the militar industry on health and the environment of people in the many diverse parts of the world..

[8] S. Latouche (1995), p.78

[9] P. Barcellona (1990)

destabilisation, structural adjustment plans and the rampant competition intrinsic to the process of globalisation. As Latouche writes, once again taking up the term "megamachine" from Lewis Mumford's analyses to indicate the emerging technological system, "the megamachine does not lack defects, it is not entirely homogeneous. Jacques Ellul's analyses of technique are correct in general but his pessimist conclusion seems a little excessive"[10]

It is therefore possible to individuate experiences of technological/enterprise trajectories in many diverse parts of the world that are inserted in the spaces left by the "megamachine" and which set themselves apart from neoliberalist thinking. These experiences may be grouped in at least four subsets: (1) Experiences of creative technological trajectories that are realised within processes of self-determination of community within a given area (for example the Zapatista movements in Chiapas or those of the Landless movement in Brazil); (2) Experiences of creative technological trajectories that are realised in specific areas to counter particularly violent multinational policies that propose privatising water, not selling essential medicines unless at prohibitive prices for the survival of millions of people, selling seeds realised with GMO even though this sale causes negative effects for the alimentary survival of those people and so on; (3) Experiences of creative technological trajectories by multinationals that operate against the mainstream like those of the aforementioned BLIHR group; (4) Experiences of creative technological trajectories to enhance expertise and respond to the needs of social groups that are often rich in traditional wisdom and enterprise capacity but weak on the economic and power fronts (indigenous communities, communities of immigrants, women and men in the poorest rural areas, disabled men and women etc.).

In this paper, we will present only experiences of creative technological trajectories that can be grouped together in the fourth category, after first outlining an articulate definition of "creative technological trajectories". After discussing four case studies, we will draw a number of conclusions to then consider in a specific way the Italian context and verify the transferability of the examples made to a specific region: Emilia Romagna.

2. Defining the term "creative technological trajectories"

The concept of "technological trajectories" was introduced by Giovanni Dosi (1982) in contrast to the term "technological paradigm" (analogously to the contraposition made by Kuhn between a scientific trajectory and scientific paradigm). For Dosi, the "technological paradigm is an ensemble of perspectives, a definite range of possible ways of acting, a definition of important problems and of the knowledge needed to resolve them" while the "technological trajectories" are the directions that are materially taken by a player (a firm), which take account both of the pressures coming from the technology used to date that drive toward incremental technological innovations or breakthrough innovations (concerning *technology push theories*) as well as the pressures that come from the market (concerning the *demand-pull theories*), bearing in mind that among these pressures that said player should always take account of the related advantages/disadvantages in terms of profit that each trajectory entails.

This kind of formulation has been successful both because it defines technology as an ensemble of incremental knowledge as well as because it allows considering the various technological trajectories concretely realised in space/time in their diverse stages (stages of planning, experimentation, formalisation through patents or in compliance with legislation, industrialisation, sale and diffusion, reaction by user) with all their relative unpredictability depending on conflicting pressures (technological, social and market) and on the subjective cost/benefit choices. This method of procedure within the constraints of competition of the market and technological development was successively made more complex by inserting the analysis of the "negative external effects" and the "social costs" in this scheme to readjust the basis for evaluating the "efficiency" of investment.[11]

The term "technological trajectory" is therefore sufficiently broad to be able to be used and has the advantage, given it is a single trajectory, of contrasting terms such as "technical system" or "technical

[10] S. Latouche, op. cit., p.76

[11] Examples in this sense may be found in the literature referring to Michael Porter and that recently developed by Gereffi and Kaplinsky on the production lines in which developing countries also participate.

macrosystem" [12] which have been defined starting from the idea that the different technologies (and the different technological trajectories) tend to "make systems" so that technological interdependencies are realised with which the single trajectory must measure up to. The relationship between technological trajectories and "technical macrosystem" is an "open" relationship in the sense that the presence of a given "technical macrosystem" (like a given technological paradigm) is one of the pressures on the trajectory though there is no deterministic relationship.

However, in Dosi's analysis, the term "technological trajectory" is to be found in a "neutral" logic of rivalry/competition between firms and in this kind of analysis the scenarios of neoliberalism are not in discussion. What happens then if within the possible technological trajectories those that operate by setting themselves apart from neoliberalist thought are considered? In this paper, these technological trajectories are defined with the term "creative technological trajectories" to counterbalance the "destructive technological trajectories" envisaged by the aforementioned technological scenarios, and the objective here is to give their definition and, successively, their verification.

An initial reference point to define the term "creative technological trajectory" is the contribution by Andrew Feenberg [13] who tackled the critical theories of technology and the possibility of an alternative technology from the viewpoint of the philosophy of science. Feenberg presents a very articulate picture of the critical theories of technology and counterpoises a "constructivist" critical theory to the "essentialist" critical vision of technology that tends (like Jacques Ellul) to see technology as autonomous and substantially uncontrollable. The theory likewise contests the principles of efficiency/profit/competition present in neoliberalist thinking, but is more possibilist on the capacity to define alternative technological trajectories against the dominant values of "modernity". Feenberg (1995) analyses the struggles of the ecological movements against nuclear energy, the alternative paths in medical experimentation and informal community networks that use communication technologies. On the basis of this research, Feenberg (1999, p.268) can conclude with this affirmation: "Unexpected struggles over issues such as nuclear power, access to experimental treatment for AIDS patients, and user participation in computer design remind us that the technological future is by no means predetermined. The very existence of these struggles suggests the possibility of a change in the form of rationalised technique. They prefigure a construction of modernity in which modern technology reunites a world in itself, rather than reducing the natural, human and social environment to mere resource. Instead of obtaining a greater amount of goods from the dominant socio-economic system, the aim should be that of defining a better way to live, a realisable ideal of abundance and of free and independent people. If technology is involved in the democratic movement of history, then we may hope of living in a very different future to the one which essentialist critique envisages. In that future, technology is not a fate one must accept but a challenge to political and social creativity"

Individuating "creative technological trajectories" therefore means singling out technological trajectories in the sense that Dosi puts forward but which, beyond the company-orientated logic to which Dosi inspires, do not have the quest for the greatest possible profit as their sole and decisive goal, but interweave technological innovation with other kinds of innovation with the objective of producing greater social ties, solidarity and wellbeing for the greatest number of people possible through alternative ways ("creative") of doing research, study, production, association, market, credit and consumption.

Globalisation has imposed a cultural hegemony on the concept of market, society and modernisation capable of embracing entire human reality. Moreover, as Jacques Généreux, who is part of the MAUSS (Antiutilitarian Movement in Social Sciences), writes (2004), when a concept reaches the stage of "semantic imperialism" [14] it has the power to reduce or completely eliminate the notion that there may exist "other ways" thereby reducing the potential of resistance to dominant powers.

In practice, this kind of dogmatism divides society in at least three different groups: (i) those that promote and believe in the greatness of liberalisation, privatisation and internationalisation; (ii) those that feel that globalisation should be regenerated by giving it a "human face", with participation

---

[12] On this topic see the book by A. Gras (1993)

[13] See A. Feenberg (1991, 1995, 1999, 2005)

[14] J. Généreux (2004) p.84

from "below", and a little "de-globalised"; and, lastly, (iii) those that apparently belong to a middle class, apathetic to the cause, that accept the *status quo* instead of risking to move in the unknown territory of alternatives. How can a way out of these three paths, which identify situations of acceptance, small modifications or passivity, be found? The way indicated by Généreux is that of bearing in mind that "the dual idolatry of capitalism as god or demon thus forms the two sides of the wall blocking the road to a real social revolution"[15] and that "neoliberalism denounced by movements of the other globalisation is not the *death of the politician* in the face of the triumphant economy but rather the *triumph of a policy* that favours the holders of capital"[16]

The invitation of Généreux is to "once again resume doing politics" against neoliberalist thinking and this "resumption of doing politics may today be done through strategies that are found at various levels: (a) at a global level, as Amnesty International and other international bodies undertake, supporting the initiatives of the UN Commission on Human Rights, the campaigns to boycott industries that produce arms, pressure to impose the Tobin Tax on the movements of speculative capital etc.; (b) at a local level, through political movements like those in France promoted by the *Decroissance* magazine, and in Italy by the Charter of the new municipality; (c) at a national level, through unions and parties, bearing in mind the invitation by Généreux made to the militants of the movements "to take part in the traditional political parties to give greater weight to all those who have remained with a certain self-denial, telling themselves that it is precisely when politics is more disappointing that it needs to be done"[17]

The different political choices present in the context in which the creative technological trajectories operate are certainly influenced by both the diffusion as well as the different political impact. It is necessary to always bear in mind that these trajectories do not necessarily represent the "best possible solution" in that given context and that in this stage it is not reasonable to choose one rather than another among the three possible political strategies (global, local, national levels). A technological trajectory may be defined as "creative" (with all its "political" limits) if, through that trajectory, a given community or group of people has from a time t to a time t+1 set itself apart from neoliberalist thinking, managed to improve its quality of life, increased its knowledge and entrepreneurial capacity, reinforced the bonds of solidarity among those working in that given trajectory and the players of that given territory (with particular attention to the weaker players and with less power), and enhanced the environmental and cultural resources present. Having different objectives to those that solely seek profit, these creative technological trajectories represent a moment of emancipation from the neoliberalist thought and its destructive technological or indifferent tendencies to people's needs.

One may therefore speak of a "creative technological trajectory" when the action carried out by a group of people associated in the most diverse of forms and structures (from the association to business, from the banking structure to a local firm) has the prime objective of improving the quality of life of all the women and men of a given community and secondly is self-sustainable and able to oppose the logic of capitalist exploitation.

The two main terms characterising a creative technological trajectory may be identified as "conviviality" and "autonomy". "Conviviality", in the sense given by Ivan Illich (1973), is the pleasure of living together and sharing the objectives of a working/ technological /entrepreneurial path in which technological innovation is closely linked with social innovation, scientific technical knowledge is closely interwoven with humanistic knowledge, and ethics is linked with the economy. With regard to "autonomy", this means the capacity of all those participating in this technological/ entrepreneurial trajectory to decide on the organisation of their work and to see their technological and humanistic knowledge develop and interweave with the growth and enhancement of environmental and cultural resources of the community in which this trajectory is based.

Conviviality is synonymous with participation, while emancipation is synonymous with collective autonomy. In such a way, the players of that given trajectory and of the context in which the trajectory is set (workers, consumers, producers, moneylenders, administrators etc.) are able to blow

15 J. Généreux (2004) p.87

16 J.Généreux (2004) p. 98

17 J.Généreux (2004) p. 103

the "cold" wind brought on by the capitalist market away and reconstruct the "warm" circle of solidarity and community.

The characteristics of these "creative technological trajectories" can be different and it is important that their analysis proceed point by point because, as was noted beforehand, this does not concern individuating "the best possible solution" but rather documenting a trajectory which, notwithstanding its limits, allows a positive shift of an ensemble of conditions in which women and men live in time t to an ensemble of changed conditions due to the effect of the technological trajectory in time t+1.

There are ten points to bear in mind in the analysis of these trajectories, namely[18]: (i) *social dimension*: the relational dimension of people participating in realising the trajectory that is represented in the production of a given good and service, but also the relational dimension of these people with those that are part of the context in which the trajectory is inserted and, if the trajectory is a "long network" the relational dimension with people in distant contexts who are the receivers of products and services created by that trajectory; (ii) *environmental dimension*: respect for nature and the health of those involved in the trajectory in all its stages; (iii) *economic dimension*: a balance of the costs needed to realise a determinate production and the economic advantages that derive from it (higher quality, less costs of waste management, worker autonomy...); (iv) *organisational dimension*: analysis of the string of players and the space needed to realise the creative trajectory; (v) *temporal horizon*: internal and external changes taking place in time and which affect the reaching of the originally foreseen objectives; (vi) *valorisation of differences*: the ability of the creative trajectory to appreciate and enhance the differences characterising people starting from the diversity between men and women (diversity of race, age, education, different abilities, etc.); (vii) *adaptability*: the ability of the trajectory to adapt to the needs of people participating in the trajectory and the different social contexts in which the trajectory is set; (viii) *participation*: direct involvement in the trajectory of many players and categories of people from the planning stage to that of realising products and services; (ix) *transferability*: the possibility that a creative technological trajectory may be reproduced in a different cultural and territorial context. This variable must take into consideration the cost of planning and innovation that permit the reproduction of the trajectory in another context; (x) *limitations and developments*: identifying the limitations and the potential modifications that may be carried out to improve the trajectory.

The identification of "creative technological trajectories" as "good practices" is therefore to be made by highlighting the positive aspects but also the shortages that may emerge with regard to the various points. It is only through an identification and non-hagiographical evaluation of the creative technological trajectories that it is possible to contribute to the transferability of these "good practices" and permit a problematic, though not pessimistic, reflection of the alternatives to neoliberalist thinking.

3. Examples of creative technological trajectories

In the choice of these four creative technological trajectories, examples of type (4) were considered having the common trait of enhancing and responding to the needs of weak social groups with respect to their economic standing and power levels (indigenous communities, immigrant communities, women and men in the poorest rural areas, the disabled, etc.).

The choice took into consideration not only different continents (Africa, South America, Asia, Europe) but also different promoting or organising bodies (an association, producer's cooperative, a bank, a research centre linked to a state or regional policy) in such a way as to indicate that the range of possibilities of creative technological trajectories is very broad.

What unifies these four experiences is that they concern creative trajectories carried out by local players. Therefore, international cooperation in which players of the triad fund technological

[18] These ten points, as specified by Capecchi (2004) are used by Capecchi in the website www.tecnologiadisabile.it that presents good practices of technological and social innovation for the elderly and disabled

trajectories that involve players from other parts of the world were not considered among these example cases.

As is clearly evident from the chosen examples, if the company-orientated balance of costs/benefits is to be employed, then these creative technological trajectories optimize the social result and minimize the costs of social and environmental exploitation. Therefore, technological trajectories that evolve towards an objective of collective social efficiency (instead of exclusively productive efficiency) and favour convivial forms of participation are considered creative, whereas other systems of production that entail the support of communities but which are damaging to the environment or to people, must be considered "destructive" (an extreme case is the opium cultivation for export).

Trajectory n.1: Experience of social investments in infrastructures, social services and collective production through the use of the savings of Moroccan migrants. The case of the Migration & Development Association (Taroudant, Morocco).[19]

Short history: in the mid 1980s, a group of Moroccan immigrant workers in France set up an association under then name "Migration & Development" to collect funds destined for the development of infrastructures (electrification, roads and water) in the zone from which they originated (in the south of Morocco, province of Taroudant). A little later, they created a twin association in Taroudant, the provincial capital where their home villages are located. With the completion of rural electrification projects, the construction of tarmac roads and wells for irrigation and collection of the little rainfall that characterises the area, the local association began to fund the creation of production cooperatives to generate income in the poorest villages of the zone. The cooperative's members do not necessarily have a relation abroad who sends savings to the association. In 2002, the production of argan oil, a shrub originally from the south of Morocco and also saffron began. These two projects alone (there are others, such as the production of artisan cloth, which at the time of the field study were in their initial stages and for which data are not yet available) provide work for roughly 500 families.

(i) *social dimension:* despite the fact that not all the families have a relation abroad who may give part of the savings to the association, the money collected is used for the entire community without discrimination both in the case of infrastructure investments as well as in social and productive investments.

(ii) *environmental dimension:* the producer's cooperative of argan oil does not use pesticides or fertilizers. The shrubs are autochthonous, the leaves serve as fodder for the raising of semi nomadic goats, and the roots have the property of stopping the advance of the desert. The extraction of oil is done manually and without the use of chemicals and refluent water.

(iii) *economic dimension*: the economic dimension of this trajectory is noteworthy. The cooperation's ability to attract funding from French development and the European Union has had a strong multiplying effect. The use of funds collected with the remittances and with the development projects are now also used for activities that generate income. The creation of cooperatives in various sectors that increase the value of products and local knowledge have to date achieved the desired the results. In particular, the women are involved in the work of the cooperatives. The enlargement of the zone covered by the project of electrification and road networks has favoured an improvement of the conditions of access to the basic services (schools and hospitals) of the nearby villages.

[19] The material used to describe this trajectory was collected by A. Gallina during field work in 2004. The results of the survey are published in: A. Gallina (2005) and A.Gallina (2006). The website of the Migration & Development association (visited 15 December 2004) is : http://www.migdev.org/index/index.html.

(iv) *organizational dimension:* the cooperative has ancient origins in Morocco and is therefore widely used as the form of production and sale.

(v) *temporal horizon:* more than fifteen years have passed from the time of setting up the Migration & Development association to date. The managed activities and funds have constantly increased and the success of the activities carried out has made this experience renowned throughout the world.

(vi) *valorisation of diversity:* women have a central role in the projects, both because they play a role in the direction and management within the association as well as because many men have emigrated to France or Belgium in search of a well-paid job.

(vii) *adaptability:* the investments made by the Migration & Development association have shown the ability to be adaptable to the continual emigration from the Taroudant zone and therefore to the consequent demographic changes. Another aspect linked to adaptability has been the capacity to focus on productive sectors (argania and saffron) which have strong local roots but which are also linked to long networks of global trade.

(viii) *participation:* the project carried out by the Migration & Development association has stimulated the spontaneous creation of associations among villages. Partnerships have been created from the provincial capital (Taroudant), where the association is based, with the associations in the rural villages to decentralise the realisation and management of projects and to define intervention priorities.

(ix) *transferability:* this experience, to an extent comparable only to the hometown associations of Mexican migrants in the United States, cannot be readily replicated even in the neighbouring villages and cities given the specific nature of the role carried out by the promoter group in France.

(x) *limitations and developments:* one of the major limitations is the fact that the collection of funds depends on the flow of remittances from France. The possibilities to start a process of indigenous development with entirely local resources are limited even though the income generating activities begun with this project may represent one of the possible alternatives in the future. Furthermore, there is enormous potential according to the groups concerned to increase the added value of the local production (argan oil and saffron above all).

Trajectory n.2 The Union of Indigenous Communities of the Isthmus Region (UCIRI) Oaxaca, Mexico[20]

Short history: The production of coffee on the Oaxaca mountains has been carried out for more than a hundred years. At the start of the 1970s, the Mexican Institute of Coffee began to monitor the presence and activities of small coffee producers in this region. In 1983, a group of missionaries supporting the Theology of Liberation helped with the creation of the first cooperative of coffee producers. Unlike the first generation of coffee producing cooperatives arising at the end of the 70s following social mobilization caused by the drop in prices, this belonged to a second generation of autonomous organisations that started in the wake of social movements of the 80s.

(i) *social dimension:* the statute of the cooperative underlines the principles of solidarity at its basis and the aim of seeking the common good for its members.

(ii) *environmental dimension:* the demographic growth of the community is causing pressure on the available agricultural land with the possible consequence of an excessive exploitation of the soil. At the same time, the introduction of biological production has entirely eliminated the use of pesticides and fertilizers.

---

[20] Laurie Waridel *et al.* (2001)

(iii) *economic dimension*: the earnings of coffee sales are distributed among the producers and invested in social sectors (schools and health) to improve the quality of life of the local communities. The sales are tied to the trend in fair trade to which the cooperative is connected for distribution in Europe.

(v) *temporal horizon:* it is still not yet possible to verify the results of the technological and product innovations that have been adopted by the cooperative.

(vi) *valorisation of diversity:* the organisation has a horizontal structure, in which both women and men are represented in the production and decision-making. Although the men appear to participate to a greater extent in the meetings, they never make autonomous and immediate decisions but only following discussions with their respective wives.

(vii) *adaptability:* the community structure is very flexible and readily adapts to changes occurring in its history, as for example the passage from traditional to biological crops.

(viii) *participation*: the cooperative unites 53 communities, corresponding to roughly 2.350 people (in 2001). The level of participation is very high; each community is represented by a delegate whose task is to report the discussion made at the general assembly to the family representatives of the community. In turn, the families are represented by the head of the family who may be a man or woman. Many of the communities belong to the indigenous matriarchal Zapotecas group.

(ix) *transferability:* there are similar experiences in many other parts of South America. The particular feature of this trajectory is the political circumstance from which it arose.

(x) *limitations and developments:* the hostility by local intermediaries of coffee. With the excuse that they supported the Zapatista Army of National Liberation, soldiers have assassinated at least 39 people between 1985 and 1992. Another, in our opinion very severe, limitation is the dependency on foreign fair trade markets, even if the data show a strong expansion in this field of commerce (+20% a year in Europe).

Trajectory n.3: Experiences of a microcredit bank, the Grameen Bank directed by Muhammad Yunus, to favour entrepreneurial initiatives (female in particular) of the Bangladesh region in India. [21]

Short history: The history of the Grameen Bank is tied to the history of Muhammad Yunus. Yunus was born in 1940 in Chittagong, the main mercantile port of Bangladesh, and graduated in economy at the Dhaka University. In 1965, he won a Fulbright scholarship to study in the United States at Boulder and then the Vanderbilt University, where he followed the lessons in advanced statistics by Nicholas Georgescu-Roegen, the innovative author of books such as *Bioeconomy,* a text translated by Mauro Bonaiuti (2003). At the Vanderbilt University, he took his PhD in economy in 1970 and returned to India in 1972 after having supported the liberation movements of Bangladesh while in the United States. At Chittagong in India, he taught at the university where he had graduated and took part in the recently elected government planning commission that was facing the terrible famine of 1974. He decided to concentrate on how to help the rural population of Bangladesh and the story of how he was to imagine and found the Grameen Bank in 1977 is described in his book (ed or. 1997), entitled *Towards a world without poverty*. The Grameen name derives from the word *gram* meaning "village", so that the Grameen adjective may be translated as "rural" or "of a village". At the beginning the Grameen Bank begun as the experimental branch of the Agricultural Bank of Bangladesh (Bangladesh Krishi Bank) and became an independent bank in 1983. The idea to make loans to the poor originated from an initial encounter with an Indian woman who in order to make wicker baskets and sell them could not find any loans to pay for the bamboo raw materials unless by usury so that her earnings were

[21] The principal source is Muhammad Yunus' (2004) book and the articles taken from the website www.grameen-info.org. In particular, the articles "Grameen Bank At A Glance" (August 2005) and "What is Microcredit" (August 2005).

very small after paying back the usurer. Yunus did not only decide to create a bank that makes small loans to the poor; but he also made the choice of having women as the point of reference. In Bangladesh, banks traditionally granted loans only to men so that concentrating on women for loans soon became a very significant cultural action. The strategy undertaken by Muhammad Yunus is innovative. In order to receive loans for the improvement or construction of a home, it is requested that the owner of the land (or the house) be the woman because the loan is only granted to women. At the beginning, these requisites were not accepted because the owner of the land or the house was traditionally male, but then the desire to have a habitation or a "real house" has been such that the husbands have accepted to pass ownership of the land on to their wives so that the loan might be obtained and therefore there have been more than 700.000 ownership transfers from men to women. In addition, the Grameen Bank was set up to favour the entrepreneurial capacity of women. To finance a project it is asked that there are at least 5 women, one of whom is the holder of the loan. Then women are elected with broader responsibilities because in every village there are at least 50 women who are associated with the Grameen Bank and of every 50 women one woman is elected as leader for the entrepreneurial initiatives of that village. Today, the Grameen Bank [www.grameen-info.org] is present in 36.000 villages of Bangladesh, putting into action microcredit and entrepreneurial initiatives that have led to projects such as the one of the women of the villages that have bought a cell phone with a bank loan that people may use on payment or projects that have involved 25,000 beggars, encouraging them to improve their situation by receiving loans (of 9 dollars) to begin to buy objects or alimentary products that they can sell instead of begging. In 1996, Muhammad Yunus received the Unesco Simon Bolivar Prize; in 2004, he was awarded the prize for economic and social innovation by the magazine *The Economist;* in 2004, he received an honorary degree in teaching from the University of Bologna.

(i) *social dimension*: this is the dimension most notably characterising this particular banking practice that has radically modified the traditional bank/customer relationship (where the richer and more powerful customer is favoured) and also changed the traditional relationships of power between women and men in the villages. The Grameen Bank has explicitly favoured women who, as of 2005, represent 96% of the 5.040.000 people who undertake credit/savings operations with the bank. The entrepreneurial abilities of the women have been encouraged to form solidarity relationships both in the constraint to undertake projects together (there must be at least 5 women for the project to be accepted) as well as in the manner of electing the women leader in the villages (one woman leader is elected out of every 50 women)

(ii) *environmental dimension*: attention toward the environmental dimension and the protection of the cultural heritage of the villages it at the roots of the entrepreneurial trajectories favoured by the Grameen Bank.

(iii) *economic dimension*: the economic dimension of the Grameen Bank is considerable. The creative technological trajectory is remarkable. The balance of accounts for 2005 specifies that 5.01 billion US dollars were loaned and of this sum 4.47 billions were paid back with a 99.02% credit cover. In the last twelve months (from September 2004 to August 2005) 553.03 million dollars have been given on loan by the Grameen Bank. The interests paid on the loans are always lower than those of the traditional banking system and four types of interest are foreseen: 8% for loans to build houses, 5% for students, 0% for beggars and finally loans that vary from 8% (maximum 20%) for possible investments that may generate high profits. The main characteristic of the loans is that they are long term.

(iv) *organisational dimension*: the Grameen Bank has 1609 branches and is operative in 56.012 villages. It has a staff of 14.536. The Grameen Bank is structured in a specialized manner according to the nature of the loans (loans for micro businesses, houses, education) and in accordance with the firms the Grameen Bank has contributed to set up over the years (such as Grameen Communications, Grameen Shakti/Energy, Grameen Cybernet and others).

(v) *temporal horizon*: the Grameen Bank transfers all its profits to the Grameen Fund that was created in 1994 to provide for eventual serious calamities and disasters. In 2004, these profits amounted to

7.16 million US dollars. This decision means that the bank's profits are not burdened by the tax on national income.

(vi) *valorisation of diversities:* the precise choice was made to invest in the women of the villages for the projects; indeed they also represent 96% of the bank's customers today.

(vii) *adaptability:* the investments made by the Grameen Bank are in four main areas and take account of the requirements and potential of the poorest rural population of Bangladesh: (a) *Housing for the poor*. The project of repairing/building housing began in 1984 and a maximum loan of 249 US dollars was given for every house (of which the woman could prove ownership) asking for restitution in five years with small weekly instalments (and a total interest of 8%). From 1984 to the 2005, 623.801 habitations have been refurbished/built; (b) *Loans for microfirms*. Up to 2005, loans were given 547.628 people in order to set up microfirms, with an average loan of 334 and a maximum of 19.897 US dollars; (c) *Spread of education*. Every year approximately 8.500 boys and girls receive scholarships and financial support for their education from compulsory schooling age to the diploma. For the university education, they are given loans to attend a faculty; 5,956 university students have benefited up to 2005; (d) *Spread of the network of entrepreneurial initiatives*: Grameen Communication specialises in communication services and information technology; Grameen Shktli is concerned with promoting renewable energy sources in Bangladesh; Grameen Telecom specialises in distributing mobile telephones to the villages (this firm is present in 68.000 villages today); Grameen Knitwear specialises in the production of garments and T-shirts; Grameen Cybernet is concerned with offering web services and technological solutions to businesses.

(viii) *participation:* the participation dimension is central to all the Grameen Bank's initiatives and the most significant example is the female entrepreneurial initiative in the villages.

(ix) *transferability:* the extraordinary success of the Grameen Bank has led to the transfer of this experience to many other countries. To date, there are 168 Grameen Banks in 44 countries: a considerable achievement.

(x) *limitations and developments:* The major difficulty of transferring the experience of the Grameen Bank is how to take account of the cultural contrasts present in the various contexts. The experience of Muhammad Yunus in Bangladesh is an extraordinary achievement, particularly after having undertaken a choice to favour the values of the women against the patriarchal and chauvinist values that are widespread in the villages. Transferring the experience to other contexts implies operating in the conflicts of value present in those different areas since the success of this initiative is not one of economic strategy but rather of an economic/cultural strategy. In spite of these difficulties, a widening of the experience is foreseen so that loans reaching 1.3 billion poor people throughout the world may be envisaged in the year 2025.

Trajectory n.4 Projects of technological innovation for the elderly and disabled promoted by the Danish Centre for Assistive Technology (Hjælpemiddel Instituttet) within the current welfare system in Denmark. [22]

Short history: The history of the Danish Centre for Assistive Technology should be analyzed by bearing in mind the laws with respect to welfare that are in force in Denmark. From 1970 on, the policies of welfare have been decentralised from the government to the 14 counties (regions) and to the 275 districts (local governments). In detail, the policies comprise: (a) family allowances given when the children are less than 7 years old, with higher sums if the son or daughter is adopted; (b) cheques in the form of scholarships distributed to those attending university to stimulate the continuation of studies (a very rigid admission system corresponds to these incentives, with a fixed entrance number so that it is not easy to be admitted unless one has a good scholastic record); (c) contributions to those leaving the

[22] The sources for this trajectory are: V. Capecchi (2004); Hjaelpemiddel Instituttet (2005 to, 2005 b). The website is www.hmi.dk. Another important website to consult is www.aaate.net

scholastic system and university who do not succeed in finding a job (contributions given only if professional training courses are undertaken); (d) unemployment benefit if a person has worked in the last three years and has lost his/her job; (e) a sufficiently high pension given to all those over 67 regardless of whether they had a job or not; (f) free assignment of equipment and every type of technological service to the disabled and the elderly.

In order to finance this system of welfare, the Danish people are taxed at among the highest rates in Europe, but this fiscal pressure is accepted by the population because every person benefits from a very widespread protection strategy that accompanies them throughout their lives.

The Danish Centre for Assistive Technology, founded in 1980, began as an organisation without the aim of making money, and from 1985 has been financed by public funds given by the Association of County Councils and the Municipalities of Copenhagen and Frederiksberg and financed in part also by participating in European projects or by providing consultation (it is therefore a substantially public structure although its origin is private). Since 1992, the Danish Centre has been organised with its current structure. This Centre realises research and development projects in order to diffuse technological innovation particularly for the elderly and disabled. It organises courses and conferences, has set up an important data bank on *assistive technology* and produces many publications as well as editing a journal.

To understand the workings of this centre, we consider one of its projects, namely *The House of Sofia,* that was set up in the first half of the 1990s. With this technological trajectory, it succeeded in building a technologically equipped house within a residential complex (*Sophielund Day Centre*) for the aged in the commune of Horsholm near Copenhagen. All the equipment and auxiliaries were devised through a close relationship between many players. The main objectives achieved by this project have been the following: (a) the centre has supplied technological innovation and technical expertise for the solutions found after taking account of the requirements of the elderly and disabled through the direct involvement of their associations and geriatric structures of Danish hospitals which enabled those immediately concerned to participate in the planning of the equipment; (b) the centre, acting on behalf of the Danish government, the "official buyer" of the equipment and auxiliaries, has aggregated the requirements and transformed the market of this equipment and auxiliaries from a market of "special" products into a "wide" market with a consequent fall in prices; (c) after calling on firms to participate in the projects, the centre has stimulated their entrepreneurial activity to such an extent that these firms have now created associations and export their products in Europe; (d) the focus on the possibilities offered by technology to the elderly and disabled to be more independent in their homes and in daily life has changed the policies of residence, transportation and the quality of living in Danish cities and rural areas; (e) the producers of equipment and auxiliaries have become more and more aware that the modifications and personal requests of the disabled and aged have introduced levels of flexibilities that the public as a whole appreciate: for instance, having a sink/cooking surface that can be raised and lowered in the kitchen is an option that appeals to all. The technological solutions devised for the elderly and disabled have therefore in many cases been introduced into the products for the general public by creating what has been defined as an "easy line", namely a range of easily used products.

A visit to this seventy-meter square residence allows seeing just what kind of direction a "technological house" for the elderly and disabled may take. The first impression is that of entering a normal Danish home (wooden furniture, windows with curtains, flowers etc.). It is only after this first impression that one notes all the small and more major innovations devised to enable a person moving around in a wheel chair or who has difficulty in carrying out many activities of everyday life to live well. For example, the cook top in the kitchen is set next to the food preparation surface so that the pots and pans may be readily moved; a tube is connected to the tap allowing to directly pour water into the pots on the cook top; all the basic kitchen fittings (table, sink, cook top) can be raised and lowered in order to be adapted for a disabled person in a wheelchair; all the draws, wall cupboards, and microwave oven can be opened with minimal effort; the kitchen equipment is made for those that may have arthritis of the hands (for instance a knife with a grip that enables easy cutting; the windows can be opened by remote control; the control of all the heating is computerised etc.) Many detailed interventions are likewise present in the bedroom, in the lounge and in the bathroom, and, as in the kitchen, there are little innovations (small devices to facilitate reading a newspaper for those with sight problems or adjustments to reach the wardrobes from a wheelchair) together with more complex innovations (the bed and the bath designed to allow remaining in the home even if the mobility disability becomes very serious; as an example, the possible insertion of a telpher type system that

allows transporting the seriously disabled from the bed to the bath is envisaged). Then there is a series of innovations linked with information technology, from the automatic opening of doors and windows, control of heating and possible gas leaks. In addition, there is the installation of a telephone emergency service that allows the disabled and elderly, by a slight pressure on a small apparatus (carried around the neck like a necklace or the wrist like a bracelet) to warn the local hospital in case of illness. An operator dedicated to this task 24 hours a day can then immediately respond and instantly see by the system of television cameras connecting the hospital with the home, what has happened to that given person and can provide any eventual aid.

(i) *social dimension:* the social dimension is borne in mind in many different directions. The Danish Centre's projects consider of prime importance the participation of the elderly and disabled in the experimentation and planning of the technological equipment and auxiliaries from the experimental stage on, as the *The house of Sofia* project demonstrates. The social dimension is then at the heart of the collaboration between many players that render the success of the initiatives possible: national and local governments, research centres, associations of the aged and disabled, centres of assistance and geriatric research, hospitals for the tele-emergency system, firms, business associations and unions. This collaboration of many public players is apparent in the centre's board of directors.

(ii) *environmental dimension:* The environmental dimension plays an important role in the projects of the Danish government that is very attentive to the conservation of the environment and the fight against pollution, as the cycle tracks in all Danish cities and rural zones to the spread of non-polluting renewable sources of energy such as wind power demonstrate.

(iii) *economic dimension*: the starting point for these strategies is not only social (to improve the quality of life of the disabled and elderly allowing them to live independently in technologically equipped apartments) *but also economic*. Research such as that by George W. Leason at the end of 80s in the name of the most important Danish association of the aged, the EGV Fonden of Copenhagen[23], founded in 1910, has shown that the cost of an elderly person in a warden controlled residence with constant medical and paramedical assistance in Denmark in the mid 80s was 34.000 US dollars a year, while this figure dropped to 17.000 dollars if the person were assisted at home. Moreover, in other similar studies, it was highlighted that good home support could allow savings of 5 million Danish crowns a year by reducing the occupied beds in hospital. Home assistance and encouragement to stay at home through technological innovation therefore have important economic and not only social implications. Again from the economic point of view, the creation of new firms or the technological boosting of already existing companies in the area of the technology for the aged and disabled is significant. In this respect, the Exsos (*Export of Social Systems Scandinavian Style)* consortium was set up in 1988, becoming private in 1996 (www.exsos.com) with the aim of exporting technological products and services devised in Denmark and Scandinavian countries. In addition, the economic initiatives taken at a national level, as a result of projects like *The house of Sofia,* are to be considered with respect to public policies regarding housing: (a) improvements in existing homes with the possibility to access technical and social aid (home support, public tele-emergency service twenty four hours a day) to allow the elderly and disabled to live as long as possible in their homes; (b) building new houses, constructed and furnished like *The House of Sofia* to enable their use by the disabled and elderly whose homes could not be modified (houses in the historic city centre without the possibility of installing a lift or special staircase etc.); (c) systematically set up day centres throughout the country in order to provide the disabled and elderly with specific services like lunch and social initiatives for leisure activities; (d) sheltered warden-controlled homes for the disabled and elderly who require constant support by medical and paramedical staff. This housing strategy is still carried out by the Danish government and

[23] G. W. Leason, Housing and Services for the elderly in Denmark, EGV-Fonden, Copenhagen 1988; G. W. Leason, Factors supporting the development, organization and implementation of measures for the preparation of retirement, EGV-Fonden, Copenhagen 1988; G. W. Leason, Can we afford the elderly? EGV-Fonden, Copenhagen 1989; G. W. Leason, A picture of the elderly, EGV-Fonden, Copenhagen 1989; G. W. Leason, The elderly worker, EGV-Fonden, Copenhagen 1989: The website of the Egv- Fonden is www.egv.dk

the European Commission in the Plan of Action for 2003 [24] to provide equal opportunities for the disabled, highlights among good practices that a budget has been planned in Denmark in order to reach, in the course of the next years, the building of between 800 and 1200 apartments equipped in such a way to allow the disabled and elderly to live independently without going into more expensive specialized warden-controlled residences. It should be noted that Denmark may boast certain indicators of national economic success in so far as the state budget in 2004 proved to be in surplus in spite of a nearly total welfare cover because the prevention and home assistance "pay" over the middle to long period. It is therefore interesting to note that also from different standpoints such as in France that the "Danish case" has begun to be viewed with attention.

.

(iv) *organisational dimension*: the Danish Centre is organized in two departments: one at Taastrup responsible for "mobility, quality certification and testing of the products" and one at Arhus concerned with "communication and training". The Danish Centre has a director who answers to a nine-member board of directors who act on behalf of the national, regional and local governments together with the Danish Council of Organizations of Disabled People and The Danish Rehabilitation Group. The Danish Centre has a high level of technological expertise (information technology and electronics) and the centre works closely with all the national and international bodies concerned with technological aids for the disabled and elderly, being also the head office of the AAATE (Association of European Assistive Technology).

(v) *temporal horizon:* the centre has had the ability to innovate its projects by being driven by two important forces: welfare policies that do not change direction in the Danish government also when the centre-left government passed to a centre-right government, as well as the creativity in these directions in the Scandinavian countries and the AAATE. This innovative ability clearly has a middle to long term vision and resists the neoliberalist wind and parallel idea of "crisis of welfare".

(vi) *valorisation of diversities*: the technological products and services for people, homes, as well as transportation, accessibility and circulation in the cities and the rural zones always have the characteristic of being personalised. Indeed, all the interventions take account of the particular requirements that persons with different disabilities may have in the various families living in contexts presenting different obstacles.

(vii) *adaptability*: the technological structures and aids created by the projects coordinated by the Danish Centre are not only adapted to the most varying requirements of the disabled and elderly, but also to the peaks of excellence represented by the Danish productive structure. Denmark is known for its design in the gift, fancy good and furnishing industries. An example of this adaptability is the setting up of *The Danish Centre for Accessibility* by the Danish government in 1996. This has launched a line of design based on the interweaving of shape and functionality (the name of the centre's journal is *Form & Function*) to take account of disabilities and more generally all the needs that may derive from limitations in the activities of everyday life, but without neglecting the form, the Danish *style*. The result is the production of functional objects for those with difficulties in everyday tasks that are also "beautiful" (from the design of elegant bottle tops that can also be opened by people suffering from arthritis of the hands to the design of metropolitan buses for the disabled without, however, their "beautiful" form being compromised).

(viii) *participation*: participation of the elderly and disabled associations is encouraged in the Danish Centre starting from its board of directors. Among several examples of participation, one may mention that during the project *The house of Sofia,* the Danish Centre involved *The Centre for Gerodynamics R and D* specialists for elderly patients based inside the Copenhagen Municipal Hospital, (*the Kommunehospitalet).* The proposals of technological innovation in the various rooms of *The house of Sofia* have been realized on the basis of detailed observation of a broad sample of the elderly and disabled in the geriatric wards of the Copenhagen Hospital.

[24] Commission de Communauté Européennes, Egalité de chances pour the personnes hendicapées. Un plan d'action européen, op. cit., p.13

(ix) *transferability:* the success of the Danish Centre is linked to the policies of welfare of the Danish government (policies also existing in the other Scandinavian countries). The transferability of these technological trajectories is not easy in different countries, even in other European countries that do not have the same welfare policies. Even more difficult is the transferability of these technological trajectories to contexts in which there is insufficient attention to the problems of the disabled.

(x) *limitations and developments:* the next project after *The house of Sofia,* started in 2004 and coordinated by the Danish Centre, is called the *Smart House*. The creativity and capacity for innovation within this technological trajectory are apparent also with the setting up of new structures such as *The Danish Centre for Accessibility*. The success of this trajectory is an achievement of teamwork that relies on traditions of welfare rooted in the people and on a governmental policy that has resisted neoliberalist thinking in this field. The limits are in the transferability of this model of welfare to Europe as a whole because if this "Scandinavian model" of welfare remains in a minority in an economically though less and less "socially" united Europe, it is obvious that the consequences will be perceptible also in Denmark and the Scandinavian countries.

4. Aspects emerging from the creative technological trajectories

Convergences and problems emerge from the four creative technological trajectories presented here that are important to remember in taking account of the ten points indicated.

The social dimension in all these trajectories is characterized by a strong presence of solidarity ties and not exclusion. The community aspects prevail in the Mexican and Moroccan cases: for instance, in Morocco if one of the families of the village does not have relatives overseas - and therefore cannot send remittances – they are not excluded from the projects of the Migration & Development association but participate by contributing with a higher input of work in the realization phase of the activities. Likewise, in the projects of the Grameen Bank all the social figures, comprising beggars, are accepted and the projects of the Danish Centre consider also those with serious disabilities as protagonists. There are two questions to ask. The first is that although these projects are "good practices" it cannot be assumed that in every context all the different categories of persons "with difficulties" are taken account of. For example, what happens if a disabled person lives in Morocco, Mexico or India and what happens to immigrants in difficulty in Denmark? According to the contexts there may be greater or lesser sensitivity towards some categories of persons in difficulty. Then there is another problem highlighted well by the projects of the Grameen Bank: in order to help develop a pathway of social innovation it is necessary to make value choices and towards some categories of persons. The Grameen Bank has explicitly chosen the women of the villages to counter the chauvinist and patriarchal values diffused in those areas. It is not enough therefore to generically speak of "solidarity"; it is necessary to make value choices and also to have the courage to wager on some categories of persons.

The environmental dimension is present in all the experiences but with different implications: in the first two trajectories the relationship with nature is not only a symbolic element (where there is the argan there is no desert) but it is lived out with an awareness in the choice of innovations that are to be introduced (biological instead of industrial production of coffee). One may equally speak of respect for nature by observing the values and experience of the women from the Indian villages to whom attention is given by the Grameen Bank and this respect can also be seen in a very different context such as that of Denmark

The economic dimension of these trajectories has a significant impact on the entire community. In Morocco, the ability to connect the remittances of the overseas workers with the infrastructural and structural needs of the zones of origin of immigrants has allowed to set in motion a process of emancipation of entire families and communities in a zone that has almost entirely been abandoned by governmental projects. In the communities of Oaxaca, coffee production represents the principal source of support for thousands of people. The fact of having chosen to produce biological coffee, whose price is higher, reflects a long term strategy with respect to the available natural resources, whose pollution (with the use of fertilizers and pesticides) could have negative and irretrievable repercussions on all the community. In the Bangladesh villages, the economic impact of loans from the Grameen Bank has been remarkable. Similarly, in the Danish technological trajectory the welfare

initiative loses the aspects of "cost" to become a research and business enterprise as well. The four trajectories show that it is possible to realize economic profits without having to abandon the social results of solidarity and improvements in shared living standards.

Respect for the differences can be seen in the terms in which men and women, the elderly and young have access to the technological trajectory and participate directly in it. In the first three trajectories considered, it has not been possible to verify the presence and the management of those with different abilities in the studied communities and therefore the initial question remains open.

The aspects linked to the respect for diversity are closely tied to the capacity of the commercial or productive innovation of the trajectory to adapt to the modifications that are needed in the territory and in the communities. The fact of being concerned with women in the Moroccan case for the production of argan oil, saffron and hand-woven cloth reflects to a certain degree the need to enhance the female dimension in the management of resources (the remittances) sent home by the men. There are no other men who manage the collective investments and decide the priorities of the interventions. In the Mexican case, the ability to adapt to the demographic pressure is perhaps the greatest challenge that still has not been tackled by the local communities. Whether this leads to an expulsion of some members of the community through emigration or to a further local innovation in coffee promoted production is still to be seen. Equally important is the choice of women in the trajectory promoted by the Grameen Bank and the choice of the Danish government and Danish Centre to consider those men and women, with all the various possibilities of having disabilities and handicaps, as protagonists throughout their entire life cycle.

Participation represents another central element in the analysis of the creative technological trajectories. The representation in decision-making centres and the transparency of the decisions is ensured by the fact that these are initiatives arising from below and with an entirely local "ownership". There are no external groups (such as a foreign non-governmental organisations or a group of technicians and advisers sent by the government). Above all, the decentralised organisation of the interventions in the territory has been set up in such way as to involve and stimulate the creation of other local associations.

The possibility to transfer these experiences entirely or in part is another element of great importance. The four experiences are to a certain extent unique given the history characterising them, but there are analogies with other practices in the world. The Moroccan experience presents a combination of collective social investments with collective economic investments that are not easily found in other parts of the world. However, it is certain that the experiences of the associations of the cities of origin of the South American immigrants in the United States (the Home Town Associations) could take the Migration & Development association Taroudant as a starting point. Nevertheless, the fact that the Moroccan experience arose from the input of a very charismatic person might represent a limitation in situations where such a figure is not easy to find. Also the experience of the Grameen Bank is linked to the charisma of Muhammad Yunus and the practice has been transferred to other contexts with difficulty. The second example trajectory would appear more readily transferable and has been witnessed in other experiences of fair trade, whereas the transfer, even to Europe itself, of the practices of Danish welfare carried out with the contribution of structures like the Danish Centre, are more difficult (but not impossible).

The limitations of the trajectories presented vary from case to case. In the Mexican case, the limits are bound to the strong dependency on fair trading markets in Europe and the United States. However, at the same time this represents a factor of potential development considering that the market of fair trading products is increasing markedly. In the Moroccan case, the dependence on the remittances means recognising migration as an indispensable factor for the community. Clearly, the social conditions of these village communities are characterised by the almost total absence of young men between 25 and 35, by divided families because some have remained in Europe and by a notable and premature aging if the migratory flows continue with the same pace. There is the potential that the cooperatives and product innovations, together with the techniques of production characterising them, by generating income and sufficient job opportunities, could slow down the emigrations in the future. In the trajectory of the Grameen Bank, the limitations are in the charismatic figure of Yunus and in the difficulty of transferring his courageous choices to other contexts.

There are two considerations to make. The first is the symbolic value and the "autonomy" against any kind of globalisation that these trajectories have. For example, the coffee producers in Mexico have clearly written in their statute that: [point 7]… "We want to keep our pride in being the

original inhabitants of our region, with our language, our customs. We are aware that with the new professions and businesses that our culture is changing. But we do not wish to fall into the trap of losing ourselves in things that do not improve us, like the culture of rich people and those that negotiate in order to take advantage of us and oppress us". In Morocco, the argania plant has a social characteristic, or rather "a familiar and domestic characteristic that is intimately associated with the life of very poor countries [Morocco] which without this wooden armour would be transformed into desert". [25] With a symbolic value of this kind, namely the "holy tree", as the olive tree is in many other countries of the Middle East, the society has a relationship with argania that goes well beyond the productive aspect of consumption or economic usefulness. Equally strong is the desire for autonomy and the pride of the women of the Bangladesh villages who are becoming redeemed from centuries of economic and political subjection by the men of the villages through the projects of housing and entrepreneurial initiatives by the Grameen Bank. Also in Denmark there is great "pride" in the defence of its "own system of welfare" so much so as to be considered independent of any political party.

A second aspect depends on this "autonomy", namely the importance of the "local level". "Every local space has its symbols and myths, a knowledge and implicit technique, and a socio-economic form. These aspects should not be underestimated. The rediscovery, valorisation and reappropriation of the local spaces are central elements of a strategy of resistance to the demolishing power of globalisation, both in the urban areas as well as rural ones. But how to pass from this "local level" to a "national level" and then to a "global level"?

5. Can creative technological trajectories become long networks?

The unsustainability of the neoliberalist model, demonstrated by the increase in inequalities between and within nations from the 1970s on, urges towards the search for alternative technological trajectories that envisage the emergence of different players (associations, consortia of firms, banks, research centres and public policies) and give priority to the safety and sovereignty of local communities, and this in terms of both access to resources, as well as with respect to their management according to locally established canons.

In all the cases described, it is possible to measure the "performance" of the technological trajectory from a point of view of efficiency of the returns to investment. However, it would not be reasonable to evaluate these creative trajectories using economic pointers alone. For those participating in these trajectories and systems of production it is more important to understand "for whom" and "for what reason" it is necessary to be efficient.

These studies also highlight the need to adopt "multivarious" criteria and with a "multidimensional" perspective of the balance[26] between different factors such as the environment, society, economy, institutions, and the symbols that surround the relationships. The multidimensionality of the balance creates a strong movement towards the rediscovery of "local systems of production" where it is easier to establish a direct relationship between consumers and producers. In such a way, the tight grip of transnational companies weakens since they are unable to compete on factors such as "locality" and "human contact", from which indeed they often distance themselves willingly.

The question of whether creative technological trajectories can develop into "long networks" then becomes important Can the strategy of immigrants from Morocco be extended to all immigrant communities? Can the experience of indigenous coffee producing communities of Oaxaca become a general point of reference? Can the Grameen Bank become widespread in favour of all the world's poor? Can the welfare model rooted in the mesoregion (Bruno Amoroso's term) of the Scandinavian countries be extended to Europe as a whole and from Europe spread throughout the world?

The answer is not unequivocal. Of the four trajectories considered, those that have become "long networks" to a greater extent have been those of Oaxaca, which have developed into a network of fair trading organized at a global level today, and those of the Grameen Bank that, albeit with difficulty, is present in 44 nations, even though the results are not comparable with those realized in Bangladesh.

[25] M. Abdelghani (1995)
[26] Mauro Bonaiuti, 2004, p. 186.

The answer is however sufficient to assert that the existence of a constellation of creative technological trajectories and "local contexts" is possible in the course of the history of the world. Such trajectories also operate with alternative values to neoliberalist thinking despite remaining inside the framework of the market economy, even though it is far simpler to make many more examples of destructive and indifferent technological trajectories to the values of the environment, solidarity and valorisation of differences between people beginning from that of race.

The creation of a new narrative to the antipodes of globalisation and not dominated by the myth of development and growth, above all needs a decolonisation of imagination. Analysing these trajectories allows a slow but gradual process of decolonisation, given that these are the places where we may find "the beginning of post-development". [27] The study and analysis of their evolution in a context of trading and international relationships allow us to understand that another world is not only possible but already exists.

[27] Serge Latouche, 2001, the Monde Diplomatique, May 2001, pp. 6 and 7.

Bibliography

-M. Abdelghani, 1995, Eléments préliminaires d'une monographie de quelques pratiques rituelles en rapport avec les Ayt Yassîn (Haha), Actes des Journées d'étude sur l'Arganier, Essaouira 29-30 Septembre 1995
-S. Amin, 2000, "The Political Economy of the Twentieth Century", *Monthly Review*, Vol. 52, Nr. 2, June 2000.
-B. Amoroso , 1998, *On Globalization. Capitalism in the XXI Century*, Macmillan, London.
-A. Baracca, 2005, *A volte ritornano: il nucleare*, Jaca Book, Milano
-P. Barcellona, 1990, *Il ritorno del legame sociale,* Bollati Boringhieri, Torino.
- M. Bonaiuti, 2004, "Relazioni e forme di una economia altra. Bioeconomia, decrescita conviviale, economia solidale", in A. Salsano e A. Caillè, *Quale altra mondializzazione?, MAUSS*, 2, Bollati Boringhieri, Torino [Italian edition].
-V. Capecchi, 2004 a, "Tecnologie per la qualità della vita", *Inchiesta*,
-V. Capecchi, 2004 b, "Innovazione technological a favore di persone anziane e disabili ", *Economia italiana*, 1, pp.53-82; "New technology for elderly and disabled persons", Review of economic conditions in Italy, 1, pp.51-78
-V. Capecchi, 2005, *La responsabilità sociale dell'impresa*, Carocci, Roma
- Castoriadis
-A. Feenberg, 1991, *Critical Theory of Technology*, Oxford University Press, New York
-A. Feenberg,1995, *Alternative Modernity: the Technical Turn in Philosophy and Social Theory,* University of California Press, Los Angeles
-A. Feenberg,1999, *Questioning Technology*, tr. it., *Technology in discussione*, Etas Milano 2002
-A. Feenberg, 2005
-A. Gallina , 2005, Le chaînon (manquant) entre les transferts d'argent et développement local: Le cas du Maroc, *Critique Economique*, Rabat.
-A. Gallina, 2006, Migration, financial flows and development in the Euro-Mediterranean area, *Journal of North African Studies*, Vol. 11, Nr.1, pp. 26-42, Routledge.
- J. Généreux J., "Dall'altra mondializzazione all'altra politica" in A. Salsano e A. Caillé, *Quale altra mondializzazione*?, *Revue MAUSS*, no. 2, Bollati Boringhieri, Torino [Italian edition].
-A. Gras, 1993, *Grandeur et dependence,* tr. it. *Nella rete technological . La society dei macrosystems* , UTET, Torino 1997
-Hjaelpemiddel Instituttet, 2005 a., *The Danish Centre for Assistive Technology*, Copenhagen
-Hjaelpemiddel Instituttet, 2005 b., *Provision of Assistive Technology in Denmark*, Copenhagen
-Ivan Illich, 1973, *La Convivialità*, Mondadori, Milano.
-M. Yunus, 2004, *Il banchiere dei poveri*, (new extended edition), Feltrinelli, Milano
-S. Latouche, 1995, "La megamacchina e la distruzione del legame sociale2, in AAVV, *La strategia democratica nella society che cambia*, Data News, Roma.
-S. Latouche Serge, 2001, *L'Altra Africa tra dono e mercato*, Bollati Boringhieri, Torino.
-S. Latouche, 2003a, *La decroissance. La pensée créative contre l'economie de l'absurde,* Parangon, Paris.
-S. Latouche, 2003 b, *Décolonizer l'imaginaire*, Parangon, Paris
-R. Petrella, 2004, *Desir d'hhumanté*, tr.it., *Il diritto di sognare,* Sperling & Kupfer Editori, Milano.
-K. Polanyi,,1977, *The Livelihood of Man*, tr. it. *La sussistenza dell'uomo*, Einaudi, Torino1983.
-P. Schwartz, P. Leiden, 1997, "The Long Boom",*Wired*, July, pp. 116-129
-P. Schwartz, P. Leiden, J.P.Hyatt, 1998, *The Long Boom,*
Scienziate e scienziati contro la guerra (a cura di), 2005, *Il male invisibile sempre più visibile.La presenza militare come tumore sociale che genera tumori reali*, Odradek, Roma
-L..Sklair, 2003, *Globalization: Capitalism and its Alternatives*. Oxford University Press, Oxford.
-L.Waridel, 2001, *Un café por la causa. Hacia un comercio justo*, Acción Cultural Madre Tierra, Mexico D.F.